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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,592	08/05/2003	Akiya Kozawa	20301-1	6546

7590 04/11/2006  
Cornelius O'Brien  
30 Rural DY  
New Canaan, CT 06840

EXAMINER
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WEINER, LAURA S

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 04/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/634,592	Applicant(s) KOZAWA ET AL.	
	Examiner Laura S. Weiner	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2006.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 9-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-8, drawn to an electrochemical lead-acid battery having an electrolyte comprising a lignin having a particle size between 0.01-0.8 um, classified in class 429, subclass 309.
  - II. Claims 9-13, drawn to an electrochemical lead-acid battery having an electrolyte containing at least one organic polymer selected from polyacrylic acid, polyvinyl alcohol and ethylene glycol where the polymer is an aqueous solution, classified in class 429, subclass 347.
  - III. Claims 14-20, drawn to a process of discharging a lead-acid battery, classified in class 429, subclass 50.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation, and effects (MPEP § 802.01 and § 806.06). In the instant case, the different inventions are unrelated because they are not disclosed as capable of use together and have different effects such that Group I is drawn to a battery comprising an electrolyte containing an organic polymer and an ultrafine lignin having a particle size between 0.01-0.8 um versus Group II is drawn to an electrolyte containing at least one organic polymer selected from polyacrylic acid, polyvinyl alcohol and ethylene glycol

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where the polymer is an aqueous solution.

3. Inventions I, II and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation, and effects (MPEP § 802.01 and § 806.06). In the instant case, the different inventions are unrelated because they are not disclosed as capable of use together and have different effects such that Group I is drawn to a battery comprising an electrolyte containing an organic polymer and an ultrafine lignin having a particle size between 0.01-0.8 um versus Group II is drawn to an electrolyte containing at least one organic polymer selected from polyacrylic acid, polyvinyl alcohol and ethylene glycol where the polymer is an aqueous solution versus Group III is drawn to a process of discharging a battery comprising an organic polymer.

4. Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Mr. Cornelius O'Brien on April 10, 2006, a provisional election was made with traverse to prosecute the invention of Group I, claims 1-8. Affirmation of this election must be made by applicant in replying to this Office action. Claims 9-20 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Response to Arguments***

7. Applicant's arguments with respect to claims 1-8 have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 112***

8. Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The use of "lignin" is not enabled for 1) grass lignins, which are comprised predominantly of coumaryl and coniferyl alcohol and 2) hardwood lignins are comprised of mostly coniferyl and sinapyl alcohols. Support for this is Navarrete et al. (US 6,485,867 or WO 02/28955) as described below.

The specification on page 3 states that "The constitution of lignin has not been clarified but is probably a polymerized coniferyl alcohol". Therefore, softwoods lignins, made up of predominantly coniferyl alcohol alone seems to be enabled.

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9. Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. An electrolyte such as H<sub>2</sub>SO<sub>4</sub> is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). The claims as written containing "an electrolyte containing an organic polymer and an ultrafine lignin" does not produce an electrolyte. As stated on page 4 of the specification, "an electrolyte comprises H<sub>2</sub>SO<sub>4</sub>, an additive such as polyvinyl alcohol and/or acrylic polymer and a lignin.

10. Claims 6-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 is rejected because it is unclear how a polymer can be considered "an aqueous solution". Also, it is unclear what is meant by "wherein the polymer is between about 0.1% and 13% in water". Does this mean that the polymer is present this much in regard to what?

***Claim Rejections - 35 USC § 102***

11. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Lyons et al. (WO 97/47702).

Lyons et al. teaches on page 7, line 24 to page 9, line 14, the lignin can be

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formulated as an aqueous dispersion using ammonia. In order to reach the appropriate viscosity, the particle size of the lignin can be reduced to a final particle size of from 0.1-20  $\mu\text{m}$ , preferably from 0.5 to 1.5  $\mu\text{m}$ . The lignin dispersion thus obtained can be mixed with a latex such as styrene-butadiene rubber, vinylidene chloride butadiene, neoprene or any other latex. In another embodiment, the lignin can be formulated as an aqueous dispersion using a dispersant which is stable in an acid system such as polyacrylate and the particle size of the lignin can be reduced to a final particle size of 0.5-5  $\mu\text{m}$ . The polyacrylate lignin dispersion thus obtained [*lignin having a particle size of 0.5-0.8 or 0.5-0.6  $\mu\text{m}$* ] can be mixed with a latex such for example, poly(vinyl) acetate [*organic polymer*].

### **Conclusion**

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Navarrete et al. (US 6,485,867 / WO 02/28955) teaches in column 1 / pages 1-2, that lignin is a by-product of wood pulping operations. Lignin's chemical structure is extremely complex. Lignin is generally accepted to be a three dimensional, crosslinked polymer comprised of three different phenyl propanol moieties. The relative amounts of the three monomeric compounds, coumaryl alcohol, coniferyl alcohol and sinapyl alcohol, vary with the sources of the lignin. Grass lignins, such as obtained from rice, corn or sugar cane are comprised predominantly of coumaryl and coniferyl alcohol. Softwoods lignins, such as obtained from spruce, pine, redwood, cedar and the like are made up of predominantly coniferyl alcohol alone. Hardwood

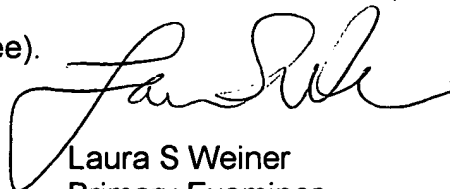
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lignins are comprised of mostly coniferyl and sinapyl alcohols and are obtained or substantially obtained from oak, cherry, maple, birch, sweet gum, mahogany and the like.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura S. Weiner whose telephone number is 571-272-1294. The examiner can normally be reached on M-F (6:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Laura S Weiner  
Primary Examiner  
Art Unit 1745

April 10, 2006